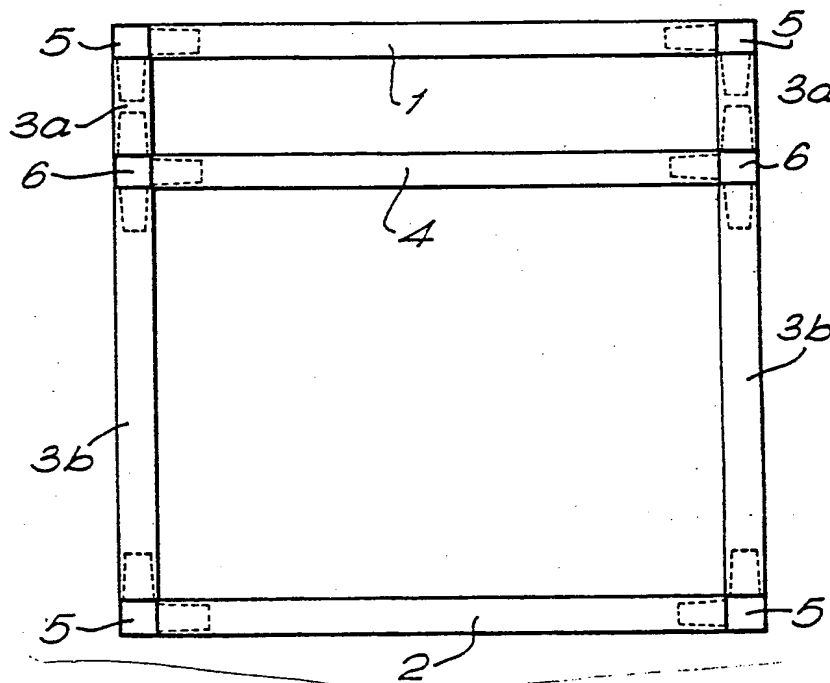


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(54) Title: FRAMES



(57) Abstract

A window or door frame or a door having a frame construction, wherein the frame comprises a plurality of frame members (1-4) wherein said frame members are of extruded box section divided into two or more internal sections by at least one longitudinal internal wall or web and wherein joints between said frame members are formed with one or more prefabricated jointing members (5-6) each having one or more spigots or fingers engaging with said frame members by insertion of said spigots or fingers into an internal section of the frame members at least two spigots or fingers being inserted into each frame members at said joints.

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FRAMES

This invention relates to window and door frames as well as to doors. The invention also relates to methods for the preparation of window and door frames and doors.

It is only in relatively recent years that the window and door openings in buildings have been made to standard sizes; the openings in older buildings often being of non-uniform dimensions.

Thus, during construction of older buildings the window and door frames, and the doors themselves, were generally made individually to fit the openings. It is now often desired to replace the window or door frames and doors of older buildings but, as the openings may be of non-standard sizes, it may not be possible to use the readily available and cheap factory prefabricated replacement units for this purpose. At present, replacement units for older buildings may therefore have to be custom built to fit the particular dimensions of the window or door openings.

The construction of conventional window and door frames and doors requires a highly skilled worker, particularly for the preparation of the joints between frame members or frame members used in the construction of doors.

The costs of replacement non-standard frames and doors are therefore high and such frames and doors cannot be constructed by unskilled workers including so-called do-it-yourself enthusiasts.

There is therefore a need for window and door frames as well as doors themselves which may be readily assembled by unskilled workers.

Thus, in one aspect the invention provides a window or door frame or a door having a frame construction, wherein the frame comprises a plurality of frame members wherein said frame members are

of extruded box section divided into two or more internal sections by at least one longitudinal internal wall or web and wherein joints between said frame members are formed with one or more prefabricated jointing members each having one or more spigots or fingers engaging with said frame members by insertion of said spigots or fingers into an internal section of the frame members, at least two spigots or fingers being inserted into each frame member at said joints.

In another aspect, the invention provides a method of assembling a window or door frame or a door having a frame construction, which comprises cutting lengths of the extruded box section material according to the dimensions of the required frame to form a plurality of frame members and engaging the prefabricated jointing members with said frame members by insertion into the box section of the frame members.

In a still further aspect, the invention provides a kit of parts for assembly into a window or door frame or a frame for a door having a frame construction comprising one or more lengths of the extruded box section material for cutting to form frame members, together with one or more of the prefabricated jointing members for engaging with said frame members by insertion into the box section of said frame members.

The framemembers are conveniently formed from extruded metal (for example aluminium) or, most preferably, plastics (for example UPVC), the extruded material being of box section. Where a window pane or glazed door is required (e.g. glazed with glass or plastics), the pane may be attached to the frame by a putty-less sealing strip, which strip may be secured to the window frame using conventional cavity fixings. If desired, frames for doors may be finished by panelling or facing with wood or other decorative material. In the simplest embodiment the frame members may have a square or rectangular cross-section with a single longitudinal internal wall. If desired, however, the frame members may be extruded with a more complicated cross-sectional shape, e.g. to give one or more rebates or grooves for attaching a window pane with putty or with a putty-less sealing strip. Similarly door frame members may have a simple square or rectangular box cross-section or alternatively more complicated shapes may be adopted as desired. In all cases the box section of the window or door

frame members is divided into two or more internal sections by one or more longitudinal internal walls; this being advantageous since the internal walls serve to strengthen and improve the rigidity of the frame. If desired, the frame members can be filled with an insulating or fire-proof material.

5 Prefabricated jointing members for use according to the invention may be, for example, L-shaped to provide corner joints such as between the sill and stiles of a window, T-shaped to provide joints between the stiles of a window and a transom, or of more complex arrangement such as to provide joints between a transom and a mullion or joints in a bay window assembly.

10 The jointing members may in one embodiment have a similar external finish and cross-sectional profile to the frame members to be joined so that the assembled window or door frame has a pleasing appearance.

15 In a preferred embodiment, the cross-sectional profile of the jointing members will similarly generally correspond to that of the frame members, so that the jointing members will have a plurality of spigots or fingers fitting into at least some of the internal sections of the frame members. This further serves to strengthen and make rigid the assembled frames. Alternatively, the joints between frame members may be formed by mitring the frame members and inserting one or more jointing members into the
20 internal sections of the frame members. Simple L-shaped jointing members may be conveniently used, and these will be hidden within the joint when the frame is assembled.

25 If necessary and/or desired one or more timber pieces or other supporting members, e.g. of plastics or metal, may be inserted into the box section of the frame members to provide support e.g. for hinges, handles or locks.

The invention will now be illustrated by way of example with reference to the accompanying drawings, in which:

30 Figure 1 is a front elevational view of an assembled window frame according to one embodiment of the invention;

Figure 2 is a partially exploded perspective view of a part of an L-shaped corner joint where the frame members are mitred;

Figure 3 is a perspective view of a T-shaped jointing member for use in the assembly of the frame shown in Figure 1;

Figure 4 diagrammatically shows in cross-section a putty-less sealing strip and glazing pane attached to a frame according to the invention;

Figure 5 diagrammatically shows a perspective view of a corner jointing member which may be used in an embodiment of the invention when the frame member is provided with a single longitudinal internal dividing wall; and

Figure 6 shows a cross-sectional view of a transom frame member having three internal walls.

Referring now to Figure 1, this shows a window frame according to an embodiment of the invention. The frame comprises seven frame members 1-4 which are formed from extruded UPVC of square box section. The lengths of the frame members are selected according to the dimensions of the window opening to be framed. The head 1 and sill 2 frame members are joined to the stile members 3a and 3b by L-shaped jointing members 5, e.g. shown in Figure 5. The optional transom member 4 is joined to the stile members 3a and 3b by T-shaped jointing members 6, which may be as shown Figure 3. If desired one or more mullion members (not shown) could be provided in the frame, which mullion members may be joined to the head and sill members by T-joints and to the transom by a +-joint. Similarly, transom or mullion members may be cut to size and simply butted to the frame members and secured thereto, e.g. with screws.

The jointing members 5 and 6 engage with the frame members by insertion into the box section of the frame members. In this respect the jointing members are provided with arms or spigots for insertion into the box section of the frame, the arms preferably being of similar cross-sectional size and profile as the inside of the box section. The arms are advantageously of such a size as to provide a tight fit in the frame members, and if desired they may be provided with one or more circumferential ribs to ensure a secure fixing to the frame members. The arms may, if desired, be slightly tapered in order to make insertion in the frame members easier. The central exposed section 8 of each jointing member is conveniently of similar size and appearance as the exterior of the frame members so that the jointing members are as unobtrusive as possible

in the assembled product. The jointing members will generally be prepared from the same material as the frame members, e.g. UPVC or aluminium.

The jointing member shown in Figure 5 is provided with two spigots 7 and may be used where the frame member has a single internal dividing wall so that the spigots have a similar cross-section to the internal cross-section of the frame member. The jointing members may be formed by injection moulding or extrusion. Alternatively the spigots may be separately formed and fixed to the body of the jointing members, e.g. by glueing or welding, either before or after being inserted into the corresponding frame members.

Figure 6 shows a more complicated cross-sectional view of a transom frame member having three internal walls, this being a very strong and rigid configuration. It will be appreciated that the corresponding jointing members for use with such a frame may have up to four spigots for insertion into the internal sections of the frame member.

In the embodiment shown in Figure 2, the frame member 20 is mitred for jointing with a similar frame member (not shown). L-shaped jointing members 21, which in this case have different sizes, are inserted into the internal sections formed by the longitudinal walls 22. If desired a third L-shaped jointing member may be inserted into the internal section 23. The joint may be secured by gluing and/or screwing as necessary and/or desired.

The frames according to the present invention may be simply and easily assembled by the unskilled worker and it will be particularly appreciated that assembly does not require any skills in the production of conventional joints.

For example, the frame shown in Figure 1 may be simply prepared from a kit of parts including a sufficient number of joints 5 and 6 and a sufficient length of extruded material to form the frame members 1-4. Thus, after measuring the width of the window opening to be framed, appropriate lengths of extruded material are cut to form the head 1 and sill 2 frame members.

Similarly, after measuring the height of the window opening the stile frame members 3a and 3b are cut. The frame members can then be assembled together by inserting the jointing members. Where the jointing

members form a tight fit in the frame member it may be necessary to hammer the jointing members gently into place.

5 There is generally no need to apply adhesive in the preparation of the joints, but this may be used if desired. Alternatively, the frames may be assembled with welding of the joints, e.g. heat or solvent welding when the frames are fabricated from plastics material, or the joints may be secured by screws, rivets or the like.

10 Once the frame is assembled, the window pane or panes may be fitted. The pane may conveniently be fitted using a seal strip as shown in Figure 4. This comprises an elongate aluminium extrusion 1 which may be fixed to the frame 2 using conventional fixings 3. The sealing strip conveniently incorporates a rubber weathersealing strip 14 and a rubber pane sealing strip 15. The pane 16 is generally glass or plastics.

15 If desired, the portion of the window above the transom may be fitted with louvred openings using conventional techniques. Similarly opening window sashes may be fitted to the window frame as desired, again using methods known in the art.

When the frame is fully assembled it may be fixed into the window or door opening of the building. This may be effected in conventional fashion.

20 The frames according to the invention are primarily intended for use as replacement frames although their utility is not limited to such use. Thus, for example, the frames may be used in new or altered buildings. Similarly, window frames according to the invention are principally intended for use as primary glazing systems (incorporating single or double glazing as
25 desired). They may, however, be used in conjunction with existing windows to provide a secondary glazing system.

Doors according to the invention may be prepared for internal or external use and can be constructed to any desired dimensions. They may thus be used, for example, as internal or external doors in domestic or commercial buildings or as other types of doors such as garage doors.

- 7 -

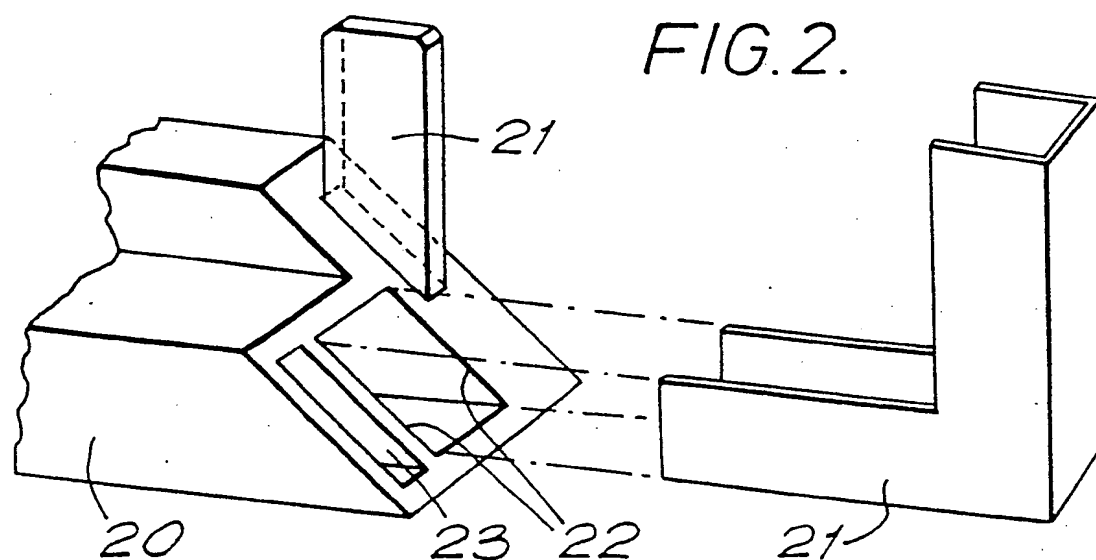
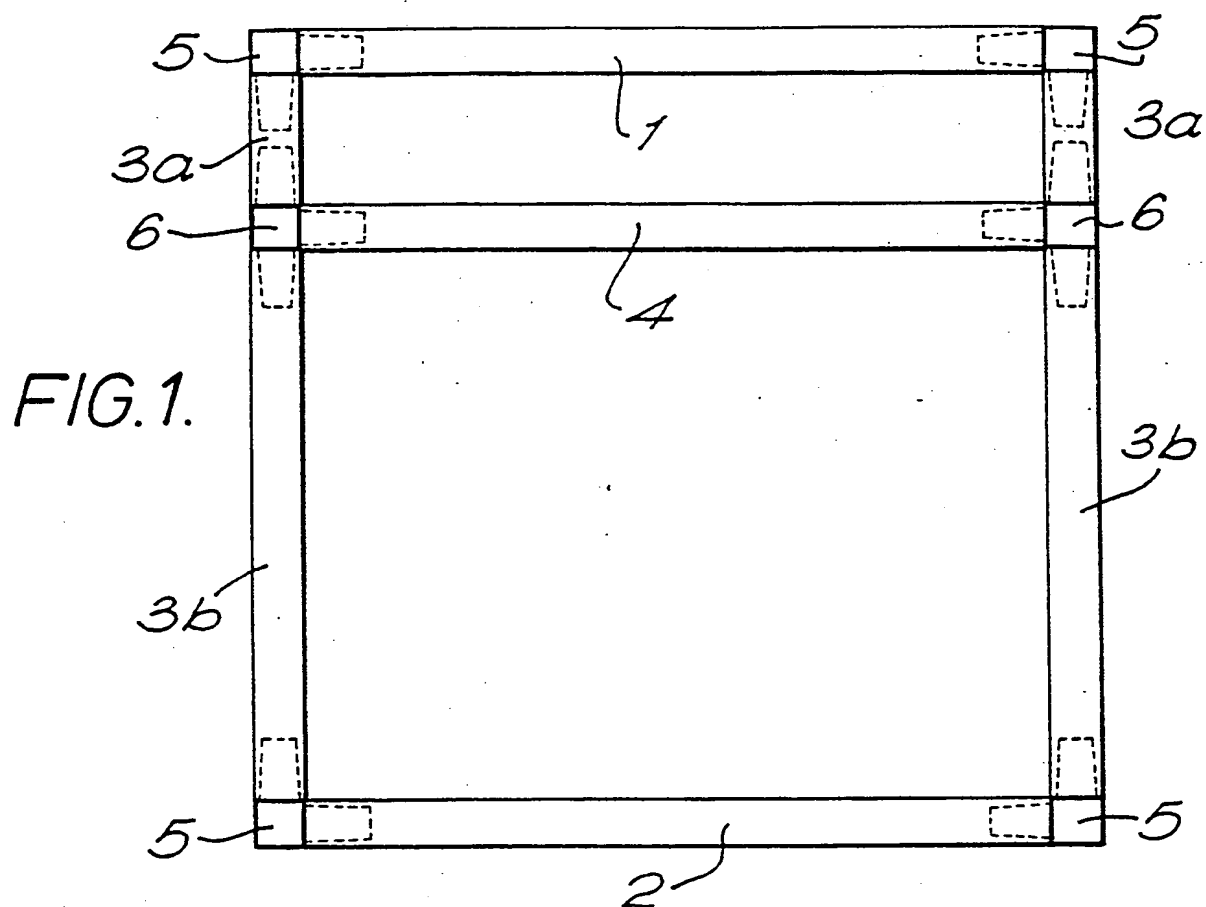
CLAIMS

1. A window or door frame or a door having a frame construction, wherein the frame comprises a plurality of frame members wherein said frame members are of extruded box section divided into two or more internal sections by at least one longitudinal internal wall or web and
5 wherein joints between said frame members are formed with one or more prefabricated jointing members each having one or more spigots or fingers engaging with said frame members by insertion of said spigots or fingers into an internal section of the frame members, at least two spigots or fingers being inserted into each frame member at said joints.
- 10 2. A frame or door according to claim 1 wherein the frame members are formed from extruded plastics or metal.
3. A frame or door according to either of claims 1 and 2 wherein the frame members have a simple square or rectangular cross-section.
4. A frame or door according to any one of the preceding claims
15 wherein the frame members are mitred and two or more internal jointing members are inserted into the internal sections of the frame members.
5. A frame or door according to any one of the preceding claims wherein the jointing members are L-, T- or +-shaped, the arms of said L-, T- or +-shaped jointing members being inserted into the frame members.
- 20 6. A frame or door according to any one of the preceding claims wherein the arms of the jointing members are of similar cross-sectional size and profile as the inside of the box section frame members.
7. A frame or door according to claim 6 wherein the jointing members
25 have a plurality of spigots or fingers corresponding to at least some of the internal sections formed by said internal walls.

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8. A method of assembling a window or door frame or a door having a frame construction, which comprises cutting lengths of extruded box section material according to the dimensions of the required frame to form a plurality of frame members and engaging one or more prefabricated jointing members having one or more spigots or fingers with said frame members by insertion of said spigots or fingers into the box section of the frame members, the box section material being divided into two or more internal sections by at least one longitudinal internal wall and at least two spigots or fingers are inserted into each frame member.
9. A kit of parts for assembly into a window or door frame or a frame for a door comprising one or more lengths of extruded box section material for cutting to form frame members, together with one or more prefabricated jointing members for engaging with said frame members by insertion into the box section of said frame members.
10. A frame or door according to any one of claims 1 to 7 substantially as herein described.
11. A frame or door substantially as herein described with reference to the accompanying drawings.
12. Each and every novel method, product, process, feature and combination of features substantially as herein described.

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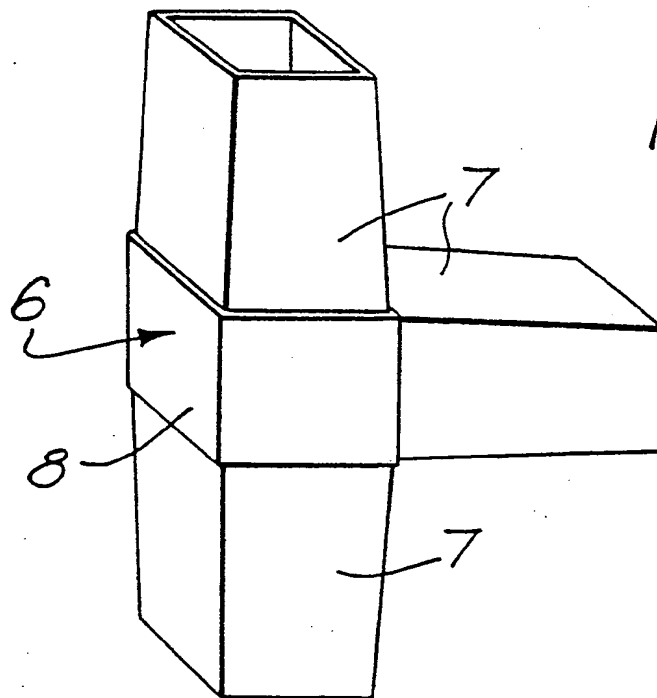
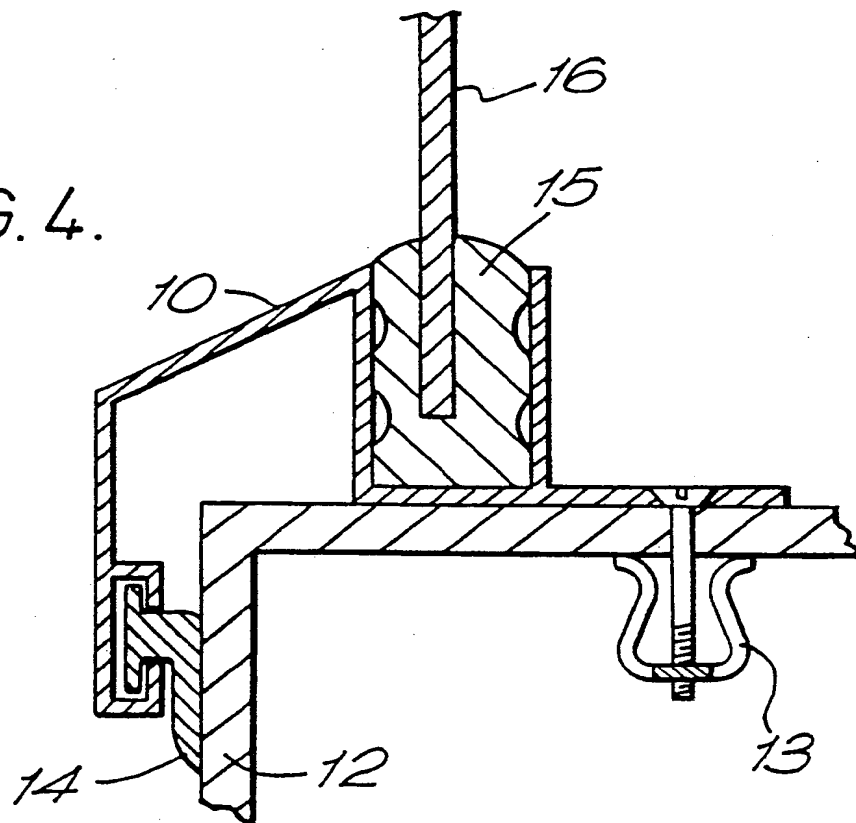


FIG. 3.

FIG. 4.



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FIG. 5.

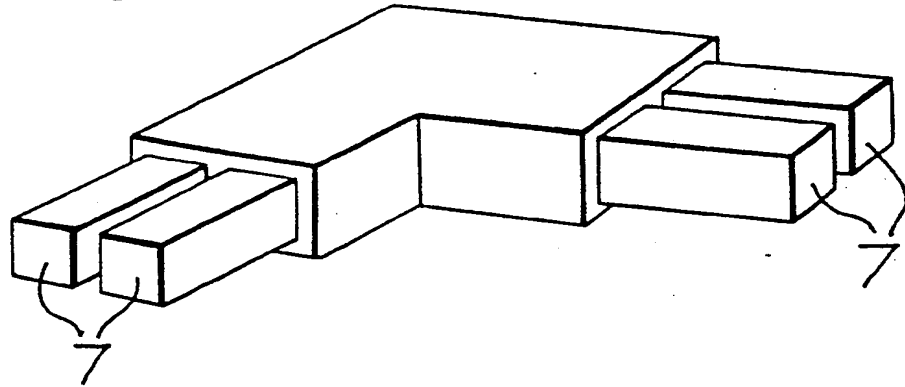
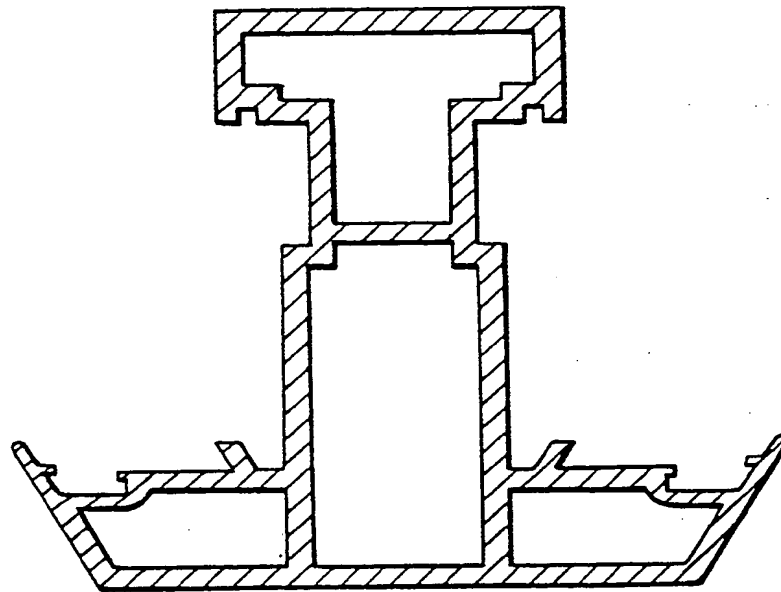


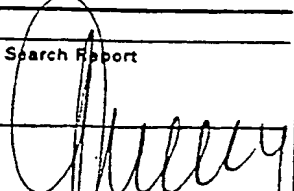
FIG. 6.



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INTERNATIONAL SEARCH REPORT

International Application No PCT/GB 85/00354

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) ⁶ According to International Patent Classification (IPC) or to both National Classification and IPC IPC ⁴ : E 06 B 3/96		
II. FIELDS SEARCHED		
Minimum Documentation Searched ⁷		
Classification System	Classification Symbols	
IPC ⁴	E 06 B	
Documentation Searched other than Minimum Documentation to the extent that such Documents are included in the Fields Searched ⁸		
III. DOCUMENTS CONSIDERED TO BE RELEVANT⁹		
Category ¹⁰	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³
X	EP, A, 0014582 (WALTON) 20 August 1980, see page 3, line 21 - page 4, line 12; page 6, line 26 - page 7, line 9; figures 1, 2, 3d and 3e	1-3, 5-12
X	DE, A, 2129170 (DUPREE) 22 June 1972, see page 1, lines 1-9; page 7, lines 12- 26; figure 1	1-3, 5-12
X	FR, A, 2277963 (COLOR PLAST) 6 February 1976 see page 2, line 23 - page 3, line 34; page 4, lines 23-28; figures 4 and 5	1, 2, 4-12
X	LU, A, 59225 (DYNAMIT NOBEL) 4 August 1969, see page 5, lines 6-12; page 5, line 23- page 6, line 6; page 7, paragraphs 2, 3; figures 1-5	1, 2, 5-12
A	GB, A, 1001204 (IMPERIAL CHEMICAL) 11 August 1965, see page 2, line 84 - page 3, line 13; figures 1-4	1-3, 5-12
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>¹⁰ Special categories of cited documents:</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> </div> <div style="width: 45%;"> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"Δ" document member of the same patent family</p> </div> </div>		
IV. CERTIFICATION		
Date of the Actual Completion of the International Search		Date of Mailing of this International Search Report
6th November 1985		26 NOV 1985
International Searching Authority		Signature of Authorized Officer
EUROPEAN PATENT OFFICE		 G.L.M. Kravdenberg

Form PCT/ISA/210 (second sheet) (January 1985)

ANNEX TO THE INTERNATIONAL SEARCH REPORT ON

INTERNATIONAL APPLICATION NO. PCT/GB 85/00354 (SA 10372)

This Annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report. The members are as contained in the European Patent Office EDP file on 20/11/85

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Patent document cited in search report	Publication date	Patent family member(s)	Publicatic date
EP-A- 0014582	20/08/80	None	
DE-A- 2129170	22/06/72	NL-A- 7110733	16/06/72
		FR-A- 2118436	28/07/72
		CH-A- 538086	31/07/73
		GB-A- 1378299	27/12/74
		AT-A,B 307656	15/04/73
		CA-A- 977918	18/11/75
		BE-A- 771105	09/02/72
FR-A- 2277963	06/02/76	None	
LU-A- 59225	22/12/69	DE-A- 1775386	30/12/71
GB-A- 1001204		None	

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